CHEMICAL & BIOLOGICAL DEFENSE

SBIR PROGRAM OVERVIEW

Mr. Larry Pollack

Joint Science and Technology Office for Chemical and Biological Defense

Chem-Bio Defense - Public Law

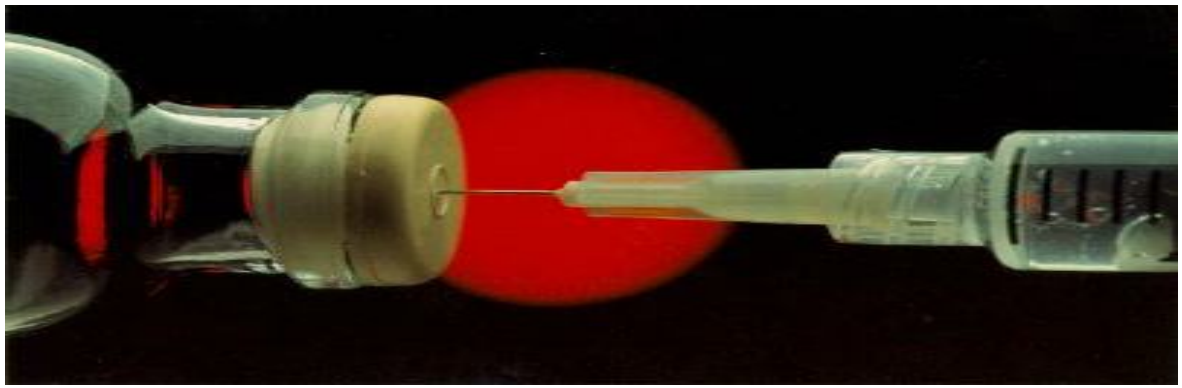
***1994:* Congress establishes the Joint Service Chemical and Biological Defense Program (CBDP) through Public Law 103-160, Section 1703**

Chem-Bio Defense - Mission Focus

Provide defense capabilities to permit U.S. military forces to operate and successfully complete missions in chemical and biological warfare environments

Chem-Bio Defense - Mission Focus

Elicit innovative solutions to address chemical and biological defense technology gaps confronting DoD



The CBD SBIR program supplements CBDP to permit small businesses the opportunity to compete for funding

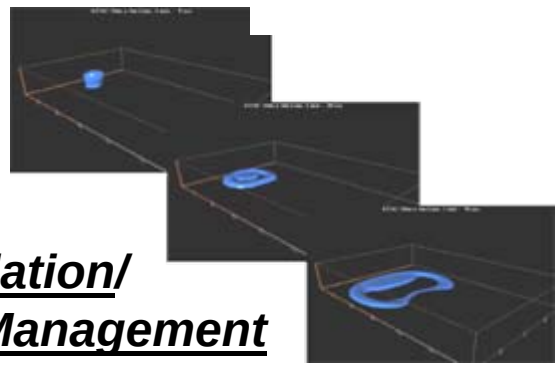
Chem-Bio Defense: Research Topic Areas

Physical Science & Technology Capability Areas

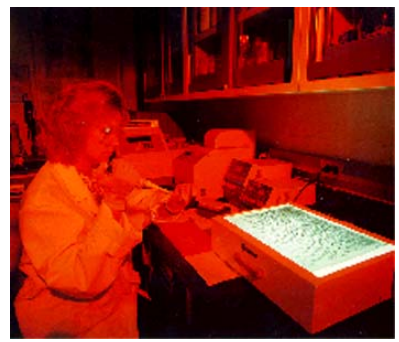
Detection

Decontamination

Protection



Modeling & Simulation/ Battlespace Management



Threat Agent Science

Detection Capability Area Technology Focus

Point Detection

Chemical Detection

Provide the warfighter with **real-time capability to detect, identify, characterize, and warn** against all known or validated chemical threats.

Biological Detection

Develop capability to **uniquely identify biological threat agents.** Includes techniques to reduce the logistical burden associated with the use of reagents.

Integrated detection technologies for chemical and biological agents

Detection Capability Area Technology Focus

Standoff Detection

Chemical Detection

Develop capability to **detect and identify chemical threat agents at a distance.** Use of imaging technology to provide a visible representation of where the contamination resides; offers wide area coverage; remote location operation and early warning capabilities.

Biological Detection

Develop capability to **detect and discriminate the presence of biological threat agents at a distance**.

Integrated detection technologies for chemical and biological agents

Decontamination Capability Area Technology Focus

Sensitive Equipment

Decontaminate sensitive interior spaces such as cargo aircraft, ground vehicles and shipboard interiors that contain complex geometry, unhardened surfaces and electronics.

Solution Chemistry

Develop a **non-corrosive and environmentally friendly oxidative, broad spectrum** chemical and biological warfare agent decontaminant with low toxicity and moderate pH suitable for use on various surfaces.

Solid Phase

Develop reactive solid phase materials with demonstrated chemical and biological agent efficacy as next generation sorbent systems.

Protection Capability Area Technology Focus

Clothing

Percutaneous protection against chemical and biological agents, radiological particles, and toxic industrial materials

Reduce the physiological stress, logistics burden, and equipment compatibility problems normally associated with wearing protective equipment

INDIVIDUAL PROTECTION

Masks

Respiratory protection against chemical and biological agents, radiological particles, and toxic industrial materials

Reduce the physiological stress, logistics burden, and equipment compatibility problems normally associated with wearing protective equipment

Protection Capability Area Technology Focus

Shelters

Protection against chemical and biological agents, radiological particles, and toxic industrial materials by **providing protected and sealed enclosures** (toxic-free area)

Prevent infiltration of threat materials and allow effective over-pressurization in transportable and mobile platforms in addition to fixed site facilities

COLLECTIVE PROTECTION

Air Purification

Purify large volumes of air for respiration and toxic free area over-pressurization in **transportable and mobile platforms and fixed site facilities;** removal of chemical and biological agents, radiological particles and Toxic Industrial Chemicals / Toxic Industrial Materials

Modeling & Simulation Capability Area Technology Focus

Battle Management

Develop capability to **utilize CB sensor data throughout the battlespace** and integrate with other relevant battlespace information and C4I systems to display and disseminate operationally meaningful information **to support decision making**

Environment

Develop enabling capability to **model and simulate CBW threats** across a range of scales from individual to theater, to provide realistic, rigorous treatment of **agent dissemination, dispersion, terrain, agent fate and downwind dispersion and deposition**

Threat Agent Science Capability Area Technology Focus

Seeks to maintain and develop scientific knowledge of current, non-traditional, and emerging threats

Agent Fate	**Model how CB agents interact with materiel and the environment**
Low Level Toxicity	**Predict human physiological response to sub-lethal doses of CB agents using model systems**
Emerging Threat	**Characterize the chemical, physical, and biological properties of traditional, non-traditional, and emerging CB agents**
Special Projects	**Identify, develop and characterize CB simulants that permit testing and evaluation of materiel and concepts at reduced costs**

Chem-Bio Defense: Research Topic Areas

Medical S&T Capability Areas

Pre-Treatments

Therapeutics

Diagnostics

Medical Capability Area Technology Focus

Pre-Treatments

- Bacterial
- Viral
- Toxins
- Multiagent Vaccines
- Alternate Delivery Methods
- Chemical Warfare Agents

Therapeutics

- Antivirals
- Antitoxins
- Antibacterial Agents
- Improved Oximes
- Advanced Anticonvulsant Systems
- Immunomodulators
- Chemical Warfare Agents

Diagnostics

- Assays/Analytical Methods
- Reagent Development
- Medical Surveillance

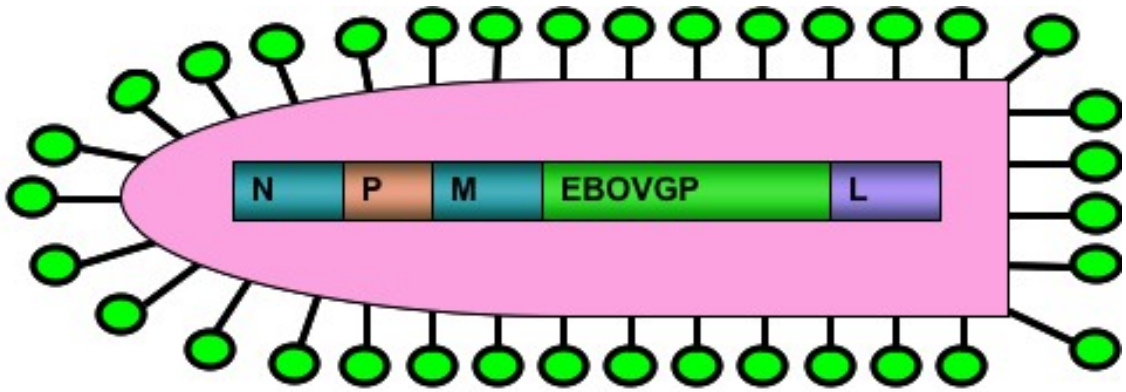
Emerging Threat/ Special Projects

- Low-level CWA Exposure
- Genetically Engineered Threats
- Genomics / Proteomics
- Medical Modeling & Simulation
- Inhalation Toxicology

Medical Pretreatments

Challenges

- DNA platforms for rapid vaccine development
- Vaccines that are adaptable to emerging threats
- Better understanding of human immune mechanisms
- Broad spectrum medical prophylaxis and countermeasures against all nerve agents



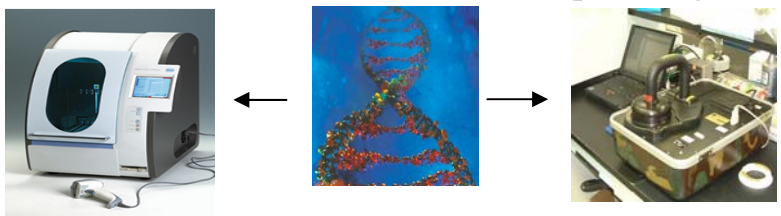
Negative-strand RNA based vaccine expression system

Medical Diagnostics

Challenges

- Biological sample viability at room temperature (or above) for up to seven days
- Integrated platform for nucleic acid, protein and small molecule toxin diagnostics
- Simple, small, and integrated sample processing and testing platforms
- Assays for early (pre-symptomatic) markers of exposure
- Rapid diagnostic tests to identify antibiotic resistance markers

Automated extraction **Rapid Diagnostics**



Joint Biological Agent Identification and Detection System - Block I

Integrated Handheld Platform

Medical Therapeutics

Challenges

- Broad spectrum therapeutics for diverse/emerging threats
- New technologies and methods to accelerate FDA licensure of new products
- Minimal systemic, neurological, ocular, and cutaneous injury due to chemical threat agent exposure
- Develop novel new interventions/approaches
- Leverage and adapt technologies developed for other purposes

CBD SBIR: Who Are We?

Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD)

- *Provides management and technical oversight of the Science and Technology component for all CBD R&D programs*

CBD SBIR

- *One element of the Chem-Bio Defense S&T Program*
- *JSTO-CBD coordinates topic generation; Phase I proposal, evaluation and selection; Phase II invitation for proposals, evaluation and selection*
- *Seeking technology developments to generate dual-use products having excellent commercialization potential*
- *Annual solicitation for proposals (FYxx.1)*
- *$10.2M FY06 program*

The CBD SBIR Process

Phase I

Feasability Study

$70K, 6 months

(+ $30K option upon Phase II selection)

Phase II

Prototype Development

$750K, 2 years

Phase III

Commercialization

no SBIR Funds

Phase I + Phase II = $850K Total SBIR

All projects are funded via contract

CBD SBIR - We're Different!

…and we are unique, too…

Chem-Bio Defense is NOT an Agency – it is a program of congressional record – its mission is to support the DoD and the warfighter – by providing technical innovations to make their jobs safer and more successful….

The CBD SBIR program has a niche technology focus:

To identify and implement solutions for issues associated with Chemical and Biological Threats

CBD SBIR POC

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CBD SBIR WEBSITE

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